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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/805,297	03/22/2004	Wen-Chi Wang	BHT-3111-442	9172
7590 08/11/2005			EXAMINER	
BRUCE H. TROXELL SUITE 1404 5205 LEESBURG PIKE FALLS CHURCH, VA 22041			NGUYEN, HIEU P	
			ART UNIT	PAPER NUMBER
			2817	

DATE MAILED: 08/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/805,297

Applicant(s)

WANG ET AL.

Examiner

Hieu Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 March 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 5-10 is/are allowed.
- 6) ☒ Claim(s) 1-4, 11 and 14 is/are rejected.
- 7) ☒ Claim(s) 12 and 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 March 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1,3-4,11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nicollini et al. (US 5668494) in view of Yen (US 5399986)

Regarding claim 1, Fig. 3 of Nicollini discloses an amplifier comprising:
an input resistor (impedance Z1) coupled to an input signal (Vin); an operational amplifier further comprising: a pre-drive stage (5) coupled to the input resistor; and a plurality of output stages (output stages: 7a, 7b and 7c), one of the output stages is chosen by a control signal to couple to the pre-drive stage; and a feedback resistor (impedance Z2) , the feedback resistor being coupled to the pre-drive stage by one end thereof and coupled to one of the plurality of output stages by another end thereof; wherein a feedback loop is formed by the chosen output stages and the feedback resistor.

Nicollini discloses everything claimed except for "a plurality of feedback resistors". However, Fig. 4 of Yen discloses an amplifying device having a plurality of feedback resistors (70,72 and 74), each feedback resistor being coupled to the pre-

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drive stage (60) by one end thereof and coupled to one of the plurality of output stages by another end thereof; wherein a feedback loop is formed by the chosen output stages (75,77 or 79) and the feedback resistor corresponding to the chosen output stage.

It would have been obvious to one ordinary skill in the art at the time of the invention was made to incorporate the teaching of Yen into the system of Nicollini by using "a plurality of feedback resistor". The ordinary artisan would have been motivated to modify the circuit of Nicollini in the manner set forth above for at least the purpose of stabilizing the gain.

Regarding claim 3, Nicollini and Yen discloses everything claimed, as applied to claim 1. In addition, Fig. 4 of Nicollini further discloses an amplifier wherein each of the output stages further comprises: a PMOS transistor (M_a), whereof a source is connected to a supply voltage (V_{cc}); an NMOS transistor (M_b), whereof a source is grounded and a drain is coupled to the PMOS transistor; a first MOS switch (SW_{ib}) coupled between the pre-drive stage and a gate of the NMOS transistor, a gate of the first MOS switch being coupled to the first control signal; a second MOS switch (SW_{ia}) coupled between the pre-drive stage and a gate of the PMOS transistor, a gate of the second MOS switch being coupled to a second control signal; a third MOS switch (SW_{id}) coupled between the gate of the NMOS transistor and ground, a gate of the third MOS switch being coupled to the second control signal; and a fourth MOS switch (SW_{ic}) coupled between the gate of the PMOS transistor and the supply voltage, a gate

of the fourth MOS switch being coupled to the first control signal; wherein the second control signal is a complementary signal of the first control signal.

Regarding claim 4, Nicollini and Yen discloses everything claimed, as applied to claim 1. In addition, Fig. 4 of Nicollini discloses a variable gain amplifier wherein each output stage further comprises: a PMOS transistor (Ma) coupled to a supply voltage (Vcc); a NMOS transistor (Mb) coupled between the PMOS transistor and ground; a first switch (SWia); a second switch (Swib); wherein the first switch is used for connecting a gate of the PMOS transistor to the pre-drive stage when the first control signal is in a first state, and the second switch is used for connecting a gate of the NMOS transistor to the pre-drive stage when the first control signal is in the first state.

Regarding claim 11, Fig. 3 of Nicollini discloses an amplifier comprising: a pre-drive stage (5) comprising a first input node (IN) for receiving a input signal (Vin); a plurality of output stages (output stage 1, 2 & 3), wherein one of the output stages is selected by a control signal to couple to the pre-drive stage; and an impedance, the feedback impedance being coupled between the pre-drive stage and one of the output stages.

Nicollini discloses everything claimed except for “a plurality of feedback impedances”. However, Yen discloses an amplifier having a plurality of feedback impedance (resistors: 70, 72 & 74), each of the feedback impedances being coupled between the pre-drive stage (60) and one of the output stages (75, 77 or 79); wherein

the gain of the variable gain amplifier is determined according to one of the feedback impedances coupled to the selected output stages and the pre-drive stage.

It would have been obvious to one ordinary skill in the art at the time of the invention was made to incorporate the teaching of Yen into the system of Nicollini by using "a plurality of feedback resistor". The ordinary artisan would have been motivated to modify the circuit of Nicollini in the manner set forth above for at least the purpose of stabilizing the gain.

Regarding claim 14, Nicollini and Yen disclose everything claimed, as applied above. In addition, Fig. 3 of Nicollini discloses the amplifier further comprising an input impedance (Z_1) coupled to the first input node of the pre-drive stage (5). According to the system of Nicollini and Yen, the gain of the variable gain amplifier is determined according to the input impedance and one of the feedback impedances coupled to the selected output stages and the pre-drive stage.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nicollini and Yen as applied to claim 1 above, and further in view of Bret (US 6400541).

Regarding claim 2, Nicollini and Yen disclose everything claimed, as applied above. In addition, Bret [Fig. 2; col. 4, lines 45-57] discloses an electrostatic discharge protection device that has external pins connected to electrical component through a resistor.

It would have been obvious to one ordinary skill in the art at the time of the invention was made to incorporate the teaching of Bret into the system of Nicollini and Yen by having an electrostatic discharge protection device. The ordinary artisan would

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have been motivated to modify the circuit of Nicollini and Yen in the manner set forth above for at least the purpose of protecting inputs against electrostatic discharge.

Allowable Subject Matter

Claims 5-10 are allowed.

Claims 5-10 are allowed over prior art because none of the prior art disclosed or suggested showing the particular structure and/or operation recited in these claims namely:

Claims 5-10 call for, among others, "a second stage operational amplification unit coupled to the first stage operational amplification unit, for providing a second gain: wherein a first feedback loop is formed by one of the output stages chosen by a first control signal and the first feedback resistor corresponding to the chosen output stage, and a gain of the variable gain amplifier corresponds to the first and the second gain".

Claim 12-13 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 12-13, the prior art of record fails to disclose or suggest a structure of a variable gain amplifier having "the pre-drive stage comprising a first output node and a second output node" in combination with the rest of the limitations of the claim(s).

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hieu Nguyen whose telephone number is 571-272-0218. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal can be reached on 571-272-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Hieu Nguyen
AU: 2817

hn


Zandra V. Smith
Primary Examiner
8/5/2005